

# **Dr. Paul A. Newman**

**Astrophysicist**  
**Atmospheric Chemistry and Dynamics Branch**  
**NASA Goddard Space Flight Center**

**RESEARCH AREA EXPERIENCE:** Atmospheric Dynamics, Stratospheric Climatology

<b>EDUCATION:</b>	1984 - Ph.D. -	Physics, Iowa State University, Ames, IA Awarded Premium for Academic Excellence
	1978 - B.S. -	Physics, minor in Mathematics, Seattle University, Seattle, WA Magna Cum Laude
<b>PREVIOUS POSITIONS:</b>	1989 - 1990	Universities Space Research Associates, GSFC
	1986 - 1989	Applied Research Corp., Landover, MD
	1984 – 1986	NASA Goddard Space Flight Center, Greenbelt, MD, National Research Council Postdoctoral Fellow
	1982 - 1984	Iowa State University, Ames, IA, L. H. Brown Pre-Doctoral Fellow
	1978 - 1981	Iowa State University, Ames, IA, Research and Teaching Assistant in Physics

## **PROFESSIONAL SOCIETY**

### **MEMBERSHIPS:**

American Meteorological Society, Middle Atmosphere Committee 1998-2001  
American Meteorological Society Committee on Polar Meteorology and Oceanography 1988-1992  
American Geophysical Union  
Arctic Airborne Stratospheric Experiment (AASE) theory team member, 1988-1991  
Arctic Airborne Stratospheric Experiment II (AASE II) theory team member, 1989-1992

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### **PROFESSIONAL SOCIETY MEMBERSHIPS: (Cont'd)**

Stratospheric Photochemistry, Aerosols, and Dynamics (SPADE) theory team member, 1992-1995  
Middle Atmosphere Effects of Stratospheric Aircraft (MAESA) theory team member, 1993-1995  
ERAST leadership team member, 1994-1997  
Associate Editor, Journal of Geophysical Research, 1998-present  
Stratospheric Tracers of Atmospheric Transport (STRAT) Co-Project Scientist, 1994-1997  
Photochemistry of Ozone Loss in the Arctic Region in Summer (POLARIS) Co-Project Scientist, 1997-2000  
SAGE III Ozone Loss and Validation Experiment (SOLVE) Co-Project Scientist, 1999-2002  
International Council of Scientific Unions (ICSU), Solar-TerrestrialEnergy Program (STEP), STEP Results, Applications, and Modeling Phase (SRAMP) Steering Committee Member, 1999-present  
Network for Detection of Stratospheric Change steering group member, 1994-present

### **AWARDS:**

Magna Cum Laude, Seattle University  
L. H. Brown Pre-Doctoral Fellow  
National Research Council Postdoctoral Fellow  
NASA Group Achievement Award (AASE I)  
NASA Group Achievement Award (Ozone Trends Panel)  
NASA Group Achievement Award (Temperature Analysis Group)  
AGU, Excellence in Reviewing award, 1992 JGR GSFC Laboratory for Atmospheres Peer Award, 1992  
NASA Group Achievement Award (Stratospheric Forecasting), 1994  
AGU, Excellence in Reviewing Award, 1993 JGR NASA Group Achievement Award (SPADE), 1994  
Naval Research Laboratory's Alan Berman Research Publication Award, 1995.

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NASA Group Achievement Award (AASE II),  
1992

NASA Group Achievement Award  
(ASHOE/MAESA),

NASA Group Achievement Award (POLARIS),  
1998

NASA GSFC Special Act Award (SOLVE), 2000  
GSFC Laboratory for Atmospheres Peer Award,  
2000

GSFC Institutional Support Award – SOLVE  
Project Scientist – 2001

Arthur S. Flemming Award – 2002

NASA Group Achievement Award  
(CRYSTALFACE Science Team), 2003

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2. "Short Meridional Scale Anomalies in the Lower Stratosphere and Upper Troposphere," P. A. Newman and J. L. Stanford, *J. Atmos. Sci.*, **42**, 2081-2092, 1985.
3. "Horizontal Mixing Coefficients Calculated from NMC Data," P. A. Newman, M. R. Schoeberl, and R. A. Plumb, *J. Geophys. Res.*, **91**, 7919-7924, 1986.
4. "Nimbus 7 Satellite Measurements of the Springtime Antarctic Ozone Decrease," R. S. Stolarski, A. J. Krueger, M. R. Schoeberl, R. D. McPeters, P. A. Newman, and J. C. Alpert, *Nature*, **322**, 808-811, 1986.
5. "October Antarctic Temperature and Total Ozone Trends from 1979-1985," P. A. Newman and M. R. Schoeberl, *Geophys. Res. Lett.*, **13**, 1206-1209, 1986.
6. "The Morphology of Antarctic Total Ozone as Seen by TOMS," M. R. Schoeberl, A. J. Krueger, and P. A. Newman, *Geophys. Res. Lett.*, **13**, 1217-1220, 1986.
7. "The Final Warming and Polar Vortex Disappearance During the Southern Hemisphere Spring," P. A. Newman, *Geophys. Res. Lett.*, **13**, 1228-1231, 1986.
8. "Mixing Rates Calculated from Potential Vorticity," P. A. Newman, M. R. Schoeberl, R. A. Plumb, and J. E. Rosenfield, *J. Geophys. Res.*, **93**, 5221-5240, 1988.
9. "Effect of Computed Horizontal Diffusion Coefficients on Two-Dimensional N<sub>2</sub>O Model Distributions," C. H. Jackman, P. A. Newman, P. D. Guthrie, and M. R. Schoeberl, *J. Geophys. Res.*, **93**, 5213-5219, 1988.
10. "Coherent Ozone-Dynamical Changes during the Southern Hemisphere Spring, 1979-1986," P. A. Newman, and W. J. Randel, *J. Geophys. Res.*, **93**, 12,585-12,606, 1988.
11. "Antarctic Springtime Ozone Depletion Computed from Temperature Observations," J. E. Rosenfield, M. R. Schoeberl, and P. A. Newman, *J. Geophys. Res.*, **93**, 3833-3849, 1988.
12. "The Morphology and Meteorology of Southern Hemisphere Spring Total Ozone Mini-Holes," P. A. Newman, L. R. Lait, and M. R. Schoeberl, *Geophys. Res. Lett.*, **15**, 923-926, 1988.
13. "Quasi-biennial Modulation of the Antarctic Ozone Depletion," L. R. Lait, M. R. Schoeberl, and P. A. Newman, *J. Geophys. Res.*, **94**, 11,559-11,571, 1989.
14. "Reconstruction of the Constituent Distribution and Trends in the Antarctic Polar Vortex from ER-2 Flight Observation," M. R. Schoeberl, L. R. Lait, M. Proffitt, P. A. Newman, R. L. Martin, D. L. Hartmann, M. Loewenstein, J. Podolske, S. E. Strahan, J. Anderson, K. R. Chan, and B. Gary, *J. Geophys. Res.*, **94**, 16815-16846, 1989.
15. "Potential Vorticity Estimates in the South Polar Vortex from ER-2 Flight Data," D. L. Hartmann, K. R. Chan, B. L. Gary, M. R. Schoeberl, P. A. Newman, R. L.

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16. "Evidence of the Mid-Latitude Impact of Antarctic Ozone Depletion," R. J. Atkinson, W. A. Mathews, P. A. Newman, and R. A. Plumb, *Nature*, **340**, 290-293, 1989.
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18. "Stratospheric Temperatures During the 88-89 Northern Hemisphere Winter," P. A. Newman, L. R. Lait, M. R. Schoeberl, and R. M. Nagatani, *Geophys. Res. Lett.*, **17**, 329-332, 1990.
19. "A Comparison of Arctic Lower Stratospheric Winter Temperatures for 1988-89 with Temperatures Since 1964," R. M. Nagatani, A. J. Miller, M. E. Gelman, and P. A. Newman, *Geophys. Res. Lett.*, **17**, 333-336, 1990.
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21. "Radiative Heating Rates during the Airborne Arctic Stratospheric Expedition," J. E. Rosenfield, M. R. Schoeberl, L. R. Lait, P. A. Newman, M. H. Proffitt, and K. K. Kelly, *Geophys. Res. Lett.*, **17**, 345-348, 1990.
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25. "Reconstruction of O<sub>3</sub> and N<sub>2</sub>O Fields from ER-2, DC-8, and Balloon Observations," L. R. Lait, M. R. Schoeberl, P. A. Newman, M. H. Proffitt, K. K. Kelly, M. Loewenstein, J. R. Podolske, S. E. Strahan, K. R. Chan, B. Gary, J. Margitan, E. Browell, M. P. McCormick, and A. Torres, *Geophys. Res. Lett.*, **17**, 521-524, 1990.
26. "Three Dimensional Simulation of Hydrogen Chloride and Hydrogen Fluoride during the Airborne Arctic Stratospheric Expedition," J. A. Kaye, A. R. Douglass, R. B. Rood, R. S. Stolarski, P. A. Newman, D. J. Allen, E. M. Larson, M. T. Coffey, W. G. Mankin, and G. C. Toon, *Geophys. Res. Lett.*, **17**, 529-532, 1990.
27. "Effects of Atmospheric Transport on Column Abundances of Nitrogen and Chlorine Compounds in the Arctic Stratosphere," J. Yatteau, S. Wofsy, R. Salawitch, M. McElroy, M. Schoeberl, L. Lait, P. Newman, A. Torres, T. Jorgensen, W. Mankin, M. Coffey, G. Toon, M. Loewenstein, J. Podolske, S. Strahan, K. Chan, and M. Proffitt, *Geophys. Res. Lett.*, **17**, 533-536, 1990.

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36. "Reactive Nitrogen, Ozone, and Nitrate Aerosols Observed in the Arctic Stratosphere in January 1990," Y. Kondo, P. Aimé dieu, M. Koike, Y. Iwasaka, P. A. Newman, U. Schmidt, and W. A. Matthews, *J. Geophys. Res.*, **97**, 13,025-13,038, 1991.
37. "An Investigation into the Reduction of Stratospheric Ozone in the Southern Australian Region," P. Lehmann, D. J. Karoly, P. A. Newman, T. S. Clarkson, and W. A. Matthews, *Geophys. Res. Lett.*, **14**, 1463-1466, 1992.
38. "The 1991 Antarctic Ozone Hole: TOMS Observations," A. Krueger, M. Schoeberl, P. Newman, and R. Stolarski, *Geophys. Res. Lett.*, **12**, 1215-1218, 1992.
39. "Long-term Winter Total Ozone Changes at Macquarie Island," P. Lehmann, D. J. Karoly, P. A. Newman, T. S. Clarkson, and W. A. Matthews, *Geophys. Res. Lett.*, **19**, 1459-1462, 1992.
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42. "A Simulation of the Cerro Hudson SO<sub>2</sub> Cloud," M. R. Schoeberl, S. Doiron, L. R. Lait, P. A. Newman, and A. J. Krueger, *J. Geophys. Res.*, **98**, 2949-2955, 1992.
43. "Chemical Loss of Ozone in the Arctic Polar Vortex in the Winter of 1991-1992," R. J. Salawitch, C. F. Wofsy, E. W. Gottlieb, D. W. Toohey, L. M. Avallone, L. R. Lait, P. A. Newman, M. R. Schoeberl, M. Loewenstein, J. R. Podolske, S. E. Strahan, A. Weaver, M. H. Proffitt, C. R. Webster, R. D. May, D. W. Fahey, D. Baumgarder, J. E. Dye, J. C. Wilson, K. K. Kelly, J. W. Elkins, K. R. Chan, and J. G. Anderson, *Science*, **261**, 1146-1149, 1993.
44. "Heterogeneous Reaction Probabilities, Solubilities, and Physical State of Cold Volcanic Aerosols," O. Toon, B. Gary, L. Lait, P. Newman, R. Pueschel, P. Russell, M. Schoeberl, G. Toon, W. Traub, F. Valero, H. Selkirk, and J. Jordan, *Science*, **261**, 1136-1140, 1993.
45. "The Seasonal Evolution of Reactive Chlorine in the Northern Hemisphere Stratosphere," D. W. Toohey, L. M. Avallone, L. R. Lait, P. A. Newman, M. R. Schoeberl, D. W. Fahey, C. R. Webster, R. D. May, and J. G. Anderson, *Science*, **261**, 1134-1136, 1993.
46. "Chlorine Chemistry on Polar Stratospheric Cloud Particles in the Arctic Winter," C. R. Webster, R. D. May, D. W. Toohey, L. M. Avallone, J. G. Anderson, P. Newman, L. Lait, M. R. Schoeberl, J. W. Elkins, and K. R. Chan, *Science*, **261**, 1130-1134, 1993.
47. "The Evolution of ClO and NO along Air Parcel Trajectories," M. R. Schoeberl, A. R. Douglass, R. S. Stolarski, P. A. Newman, L. R. Lait, D. Toohey, L. Avallone, J. G. Anderson, W. Brune, D. W. Fahey, and K. Kelly, *Geophys. Res. Lett.*, **20**, 2511-2514, 1993.
48. "Volcanic and Wave-Cloud Optical Depth Spectra from DC-8 Tracking Sunphotometer Measurements: 1. Results vs. Latitude, Time, and Vortex Structure," P. B. Russell, J. M. Livingston, R. F. Pueschel, J. A. Reagan, E. V. Browell, G. C. Toon, P. Newman, L. R. Lait, M. R. Schoeberl, and B. M. Herman, *Geophys. Res. Lett.*, **22**, 2571-2574, 1993.
49. "AASE II Stratospheric Meteorological Conditions," P. Newman, L. Lait, M. Schoeberl, E. Nash, K. Kelly, D. W. Fahey, R. Nagatani, D. Toohey, J. Anderson, and L. Avallone, *Science*, **261**, 1143-1146, 1993.
50. "Record Low Global Ozone in 1992," J. Gleason, P. K. Bhartia, J. R. Herman, R. McPeters, P. Newman, R. S. Stolarski, L. Flynn, G. Labow, D. Larko, C. Seftor, C. Wellemeyer, W. D. Komhyr, A. J. Miller, and W. Planet, *Science*, **260**, 523-526, 1993.
51. "Interpretation of NO<sub>x</sub>/NO<sub>y</sub> Observations from AASE-II Using a Model of Chemistry Along Trajectories," S. R. Kawa, D. W. Fahey, J. C. Wilson, M. R. Schoeberl, A. R. Douglass, R. S. Stolarski, E. L. Woodbridge, H. Jonsson, L. R.

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- Lait, P. A. Newman, M. H. Proffitt, D. W. Toohey, D. E. Anderson, M. Loewenstein, K. R. Chan, C. R. Webster, R. May, and K. K. Kelly, *Geophys. Res. Lett.*, **20**, 2507-2510, 1993.
52. "MLS C1O Observations and Arctic Polar Vortex Temperatures," M. R. Schoeberl, R. S. Stolarski, A. R. Douglass, P. A. Newman, L. R. Lait, J. W. Waters, L. Froidevaux, W. G. Ready, *Geophys. Res. Lett.*, **20**, 2861-2864, 1993.
53. "New Observations of the Noy/N2O Correlation in the Lower Stratosphere," M. Loewenstein, J. R. Podolske, D. W. Fahey, E. L. Woodbridge, P. Tin, A. Weaver, P. A. Newman, S. E. Strahan, S. R. Kawa, M. R. Schoeberl, and L. R. Lait, *Geophys. Res. Lett.*, **20**, 2531-2534, 1993.
54. "Correlation of Ozone Loss with the Presence of Volcanic Aerosols," T. McGee, M. Gross, U. Singh, P. Newman, G. Megie, S. Godin, and A. Locoste, *Geophys. Res. Lett.*, **21**, 2801-2804, 1994.
55. "UARS MLS O<sub>3</sub> Soundings Compared with Lidar Measurements Using the Conservative Coordinates Reconstruction Technique," G. Redaelli, L. R. Lait, M. Schoeberl, P. A. Newman, G. Visconti, A. D'Altorio, F. Masci, V. Rizi, L. Froidevaux, J. W. Waters, and A. J. Miller, *Geophys. Res. Lett.*, **21**, 1535-1538, 1994.
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61. "An Algorithm for Forecasting Mountain Wave-Related Turbulence in the Stratosphere," J. T. Bacmeister, P. A. Newman, B. L. Gary, and K. R. Chan, *Weather and Forecasting*, **9**, 241-253, 1994.
62. "A Comparison of Winds From the STRATAN Data Assimilation System to Balanced Wind Estimates", L. Coy, R. Rood, P. Newman, *J. Atmos. Sci.*, **51**, 2309-2315, 1994.
63. "UARS MLS O3 Soundings Compared with Lidar Measurements Using the Conservative Coordinates Reconstruction Technique," G. Redaelli, L. R. Lait, M. Schoeberl, P. A. Newman, G. Visconti, A. D'Altorio, F. Masci, V. Rizi, L.

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76. "Mixing of Polar Vortex Air into Middle Latitudes as Revealed by Tracer-Tracer Correlations," D. Waugh, R. Plumb, J. Elkins, D. Fahey, G. Dutton, M.

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